

We claim:

- 1 1. A diffraction grating, comprising:
2 a movable component, comprising a plurality of cross beams coupled to
3 two long beams, wherein the two long beams are parallel to one another; and
4 a stationary component, comprising a plurality of projecting beams,
5 wherein the cross beams are alternately disposed between the projecting beams;
6 wherein a plurality of square wells are formed when the movable component is
7 actuated and diffraction parallel to the long beams occurs when light strikes the
8 square wells.
- 1 2. The diffraction grating of claim 1, wherein the plurality of cross beams are
2 coupled between the two long beams.
- 1 3. The diffraction grating of claim 1, further comprising:
2 a base piece for coupling the plurality of projecting beams.
- 1 4. The diffraction grating of claim 1, the projecting beams comprising a first
2 surface and the cross beams comprising a second surface, wherein the first and
3 second surfaces comprise a substantially planar surface when the movable
4 component is not actuated.
- 1 5. The diffraction grating of claim 4, wherein the first surface comprises a
2 reflective surface.
- 1 6. The diffraction grating of claim 4, wherein the second surface comprises a
2 reflective surface.
- 1 7. The diffraction grating of claim 1, the plurality of square wells further
2 comprising:

3 a first square well having a first dimension;
4 a second square well having a second dimension, wherein the second
5 dimension is smaller than the first dimension; and
6 a third square well having a third dimension, wherein the third dimension
7 is smaller than the second dimension;
8 wherein the first square well diffracts light of a first wavelength, the second
9 square well diffracts light of a second wavelength, and the third square well
10 diffracts light of a third wavelength.

1 8. The diffraction grating of claim 7, wherein the first wavelength is the
2 wavelength of red light.

1 9. The diffraction grating of claim 8, wherein the second wavelength is the
2 wavelength of green light.

1 10. The diffraction grating of claim 9, wherein the third wavelength is the
2 wavelength of blue light.

1 11. A diffraction grating, comprising:
2 a movable component, comprising a plurality of cross beams coupled to
3 two long beams, wherein the two long beams are parallel to one another; and
4 a stationary component, comprising a plurality of projecting beams,
5 wherein the cross beams are alternately disposed between the projecting beams;
6 wherein a plurality of square wells are formed when the movable component is
7 not actuated and diffraction parallel to the long beams occurs when light strikes
8 the square wells.

1 12. The diffraction grating of claim 11, the projecting beams comprising a first
2 surface and the cross beams comprising a second surface, wherein the first and

3 second surfaces comprise a substantially planar surface when the movable
4 component is actuated.

1 13. A diffraction grating, comprising:
2 a movable component, comprising a plurality of projecting beams coupled
3 to one or more long beams; and
4 a stationary component, comprising a plurality of stationary beams,
5 wherein the projecting beams are alternately disposed between the stationary
6 beams;
7 wherein a plurality of square wells are formed when the movable component is
8 actuated such that diffraction parallel to the long beam occurs when light strikes
9 the square wells.

1 14. The diffraction grating of claim 13, the projecting beams comprising a first
2 surface and the stationary beams comprising a second surface, wherein the first
3 and second surfaces comprise a substantially planar surface when the movable
4 component is not actuated.

1 15. The diffraction grating of claim 14, wherein the first surface comprises a
2 reflective surface.

1 16. The diffractive grating of claim 14, wherein the second surface comprises
2 a reflective surface.

1 17. The diffraction grating of claim 13, the plurality of square wells further
2 comprising:
3 a first square well having a first dimension;
4 a second square well having a second dimension, wherein the second
5 dimension is smaller than the first dimension; and

6 a third square well having a third dimension, wherein the third dimension
7 is smaller than the second dimension;
8 wherein the first square well diffracts light of a first wavelength, the second
9 square well diffracts light of a second wavelength, and the third square well
10 diffracts light of a third wavelength.

1 18. The diffraction grating of claim 17, wherein the first wavelength is the
2 wavelength of red light.

1 19. The diffraction grating of claim 18, wherein the second wavelength is the
2 wavelength of green light.

1 20. The diffraction grating of claim 19, wherein the third wavelength is the
2 wavelength of blue light.

1 21. A diffraction grating, comprising:
2 a movable component, comprising a plurality of projecting beams coupled
3 to one or more long beams; and
4 a stationary component, comprising a plurality of stationary beams,
5 wherein the projecting beams are alternately disposed between the stationary
6 beams;
7 wherein a plurality of square wells are formed when the movable component is
8 not actuated such that diffraction parallel to the long beam occurs when light
9 strikes the square wells.

1 22. The diffraction grating of claim 21, the projecting beams comprising a first
2 surface and the stationary beams comprising a second surface, wherein the first
3 and second surfaces comprise a substantially planar surface when the movable
4 component is actuated.

1 23. A diffraction grating, comprising:
2 a means for moving a plurality of movable beams between a plurality of
3 stationary beams, wherein the plurality of movable beams are coupled to one or
4 more long beams, and the plurality of movable beams are alternately disposed
5 between the stationary beams;
6 wherein a plurality of square wells are formed when the plurality of movable
7 beams are actuated, wherein diffraction parallel to the one or more long beams
8 occurs when light strikes the square wells.

1 24. The diffraction grating of claim 23, further comprising:
2 a means for coupling the plurality of stationary beams.

1 25. The diffractive grating of claim 24, further comprising:
2 a means for actuating the movable component.

1 26. The diffraction grating of claim 25, the movable beams comprising a first
2 surface and the stationary beams comprising a second surface, wherein the first
3 and second surfaces comprise a substantially planar surface when the diffraction
4 grating is not actuated.

1 27. The diffraction grating of claim 26, further comprising:
2 a means for reflecting light off the first and second surfaces.

1 28. A diffractive grating, comprising:
2 a plurality of blocks arranged in a row, the row being disposed atop a
3 substrate, wherein each of the plurality of blocks can be independently moved
4 toward or away from the substrate;
5 wherein a plurality of square wells are formed when selected blocks are moved
6 such that diffraction occurs when light strikes the square wells.

- 1 29. The diffraction grating of claim 28, wherein the selected blocks are
2 alternating blocks in the row.
- 1 30. The diffraction grating of claim 28, wherein the diffraction occurs in a
2 direction parallel to the row.
- 1 31. The diffraction grating of claim 28, wherein the square wells are formed
2 when selected blocks are moved toward the substrate.
- 1 32. The diffraction grating of claim 28, wherein the square wells are formed
2 when selected blocks are moved away from the substrate.
- 1 33. The diffraction grating of claim 28, further comprising an array comprising
2 a plurality of rows.
- 1 34. The diffraction grating of claim 33, wherein diffraction occurs in a
2 direction perpendicular to the plurality of rows.
- 1 35. The diffraction grating of claim 33, wherein the diffraction occurs in a
2 direction perpendicular to the plurality of rows and in a direction parallel to the
3 plurality of rows.
- 1 36. The diffraction grating of claim 33, wherein the diffraction occurs
2 simultaneously in a direction perpendicular to the plurality of rows and in a
3 direction parallel to the plurality of rows.
- 1 37. The diffraction grating of claim 28, wherein the blocks are arranged in a
2 plurality of adjacent groups, each group including a first group row and a second
3 group row, wherein a first block and a second block occupy the first group row
4 and a third block and a fourth block occupy the second group row.

1 38. The diffraction grating of claim 37, wherein the second block and the third
2 block are actuated while the first block and the fourth block are not actuated,
3 wherein diffraction occurs both perpendicular and parallel to the row.

1 39. The diffraction grating of claim 37, wherein the first block and the fourth
2 block are actuated while the second block and the third block are not actuated,
3 wherein diffraction occurs both perpendicular and parallel to the row.

1 40. The diffraction grating of claim 37, wherein the third block and the fourth
2 block are actuated while the first block and the second block are not actuated,
3 wherein diffraction occurs perpendicular to the row.

1 41. The diffraction grating of claim 37, wherein the first block and the second
2 block are actuated while the third block and the fourth block are not actuated,
3 wherein the diffraction occurs perpendicular to the row.

1 42. The diffraction grating of claim 37, wherein the first block and the third
2 block are actuated while the second block and the fourth block are not actuated,
3 wherein the diffraction occurs parallel to the row.

1 43. The diffraction grating of claim 37, wherein the second block and the
2 fourth block are actuated while the first block and the third block are not
3 actuated, wherein the diffraction occurs parallel to the row.

1 44. The diffraction grating of claim 37, wherein one block of an adjacent
2 group is actuated while remaining blocks of the adjacent group are not actuated,
3 wherein the diffraction occurs both perpendicular and parallel to the row.

1 45. The diffraction grating of claim 37, wherein one block of an adjacent
2 group is not actuated while remaining blocks of the adjacent group are actuated,
3 wherein the diffraction occurs both perpendicular and parallel to the row.

1 46. A method, comprising:
2 disposing a movable component against a stationary component, wherein
3 the movable component comprises a plurality of cross beams coupled to at least
4 one long beam and the stationary component comprises a plurality of projecting
5 beams; and
6 actuating the movable component to a plurality of square wells, wherein
7 diffraction parallel to the at least one long beam occurs when light strikes the
8 square wells.

1 47. The method of claim 46, further comprising:
2 coating the movable component and the stationary component with a
3 reflective material such that a substantially reflective surface is formed when the
4 movable component is not actuated.

1 48. A method, comprising:
2 disposing a plurality of blocks in an array, the array comprising a plurality
3 of rows, wherein each block can be independently actuated;
4 actuating one or more blocks such that a plurality of square wells are
5 formed, wherein diffraction occurs when light strikes the plurality of square
6 wells.

1 49. The method of claim 48, further comprising:
2 actuating a first selection of the plurality of blocks such that diffraction
3 occurs in a direction parallel to the plurality of rows.

1 50. The method of claim 48, further comprising:

2 actuating a second selection of the plurality of blocks such that diffraction
3 occurs in a direction perpendicular to the plurality of rows.

1 51. The method of claim 48, further comprising:

2 actuating a third selection of the plurality of blocks such that diffraction
3 occurs in a direction both parallel and perpendicular to the plurality of rows.

1 52. A monochromator, comprising:

2 a first mirror for receiving light from a first slit;

3 a second mirror for reflecting light to a second slit; and

4 a grating for receiving light from the first mirror and reflecting light to the
5 second mirror, wherein the grating comprises:

6 a movable component, comprising a plurality of cross beams
7 coupled to two long beams, wherein the two long beams are parallel to
8 one another; and

9 a stationary component, comprising a plurality of projecting beams,
10 wherein the cross beams are alternately disposed between the projecting beams;
11 wherein a plurality of square wells are formed when the movable component is
12 actuated and diffraction parallel to the long beams occurs when light strikes the
13 square wells.

1 53. The monochromator of claim 52, wherein the grating further comprises a
2 reflective coating.

1 54. A monochromator, comprising:

2 a concave mirror having a first reflective surface and a second reflective
3 surface; and

4 a grating, comprising a plurality of blocks in a row, wherein each of the
5 plurality of blocks can be independently actuated such that a plurality of square
6 wells are formed for diffracting light;

7 wherein light received by the monochromator is reflected off the first reflective
8 surface to the grating, then diffracted to the second surface.

1 55. The monochromator of claim 54, wherein the grating is further coated
2 with a reflective material.